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ARMY APPRENTICESHIP PROGRAM (AAP)

PHASE I - ANALYSIS OF AAP PARTICIPANTS

TRADOC ANALYSIS COMMAND -
FORT BENJAMIN HARRISON

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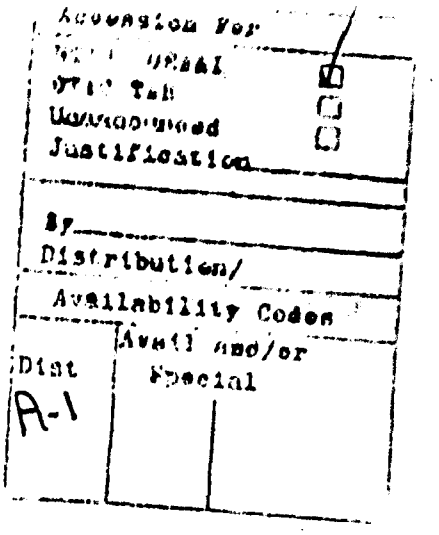

ACN 73991

ARMY APPRENTICESHIP PROGRAM EVALUATION STUDY

PHASE I - ANALYSIS OF AAP PARTICIPANTS

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATED ARMY TRAINING AND DOCTRINE COMMAND
FORT MONROE, VIRGINIA 23651

TRADOC ANALYSIS COMMAND - FORT BENJAMIN HARRISON

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SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188
Exp Date Jun 30, 1986

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION TRAC-FBHN 6b. OFFICE SYMBOL (*If applicable*) ATRC-B	7a. NAME OF MONITORING ORGANIZATION Requirements & Programs Directorate
6c. ADDRESS (*City, State, and ZIP Code*) Ft. Benjamin Harrison, IN 46216-5000	7b. ADDRESS (*City, State, and ZIP Code*) TRAC-RPD Ft. Monroe, VA 23651-5143
8a. NAME OF FUNDING/SPONSORING ORGANIZATION TRADOC, DCSPAL 8b. OFFICE SYMBOL (*If applicable*) ATPL-B	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (*City, State, and ZIP Code*) Education Directorate Ft. Monroe, VA 23651-5000	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO

11. TITLE (*Include Security Classification*)
Army Apprenticeship Program Evaluation Phase I, Analysis of AAP Participants (Unclassified)

12. PERSONAL AUTHOR(S)
Martin R. Walker

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (*Year, Month, Day*)	15. PAGE COUNT
Final Report	FROM JAN 89 TO JUN 90	90/6/25	

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (*Continue on reverse if necessary and identify by block number*)
FIELD	GROUP	SUB-GROUP	AAP, Army Apprenticeship Program, Job Training, Education Programs

19. ABSTRACT (*Continue on reverse if necessary and identify by block number*) The purpose of this report is to describe the findings of the first phase of the AAP evaluation. The objective of the study was to develop a historical and demographic profile of Army apprentices and to identify the possible benefits gained by the Army from offering the AAP. The findings of the study reveal that Army apprentices are predominantly male, even though nearly all MOSs in the AAP are available to females. Apprentices are slightly older and less educated when they join the Army. They have relatively the same percentage of mental category I-IIIA's, fewer IIIBs, and a higher percentage of category IVs as compared to Army soldiers in general. Apprentices enlisted for longer terms of service; received fewer enlisted cash bonuses and signed-up for more educational incentives than soldiers from the NPS accession population. The SQT is the Army's principal diagnostic instrument for evaluation of training, performance, and readiness. Although apprentices were previously determined to have slightly lower mental aptitudes and education attainment, in most instances, apprentices performed higher on the SQT at all skill levels than those soldiers who did not participate in the AAP. Apprentices at skill levels 1 scored significantly higher on the SQT than non-apprentices in the same MOSs. The differences in groups diminish as skill level increases. Furthermore, fewer apprentices failed to meet the minimum standard on the SQT when compared to non-apprentices. This study determined that a smaller percentage of apprentices versus the NPS accession population were forced to separate from the Army . The most significant difference in reasons why soldiers were separated was in their "failure to meet minimum behavioral and performance standards." Also, apprentices leave the Army before their commitment at lower rates and reenlist at higher rates. Therefore, the Army benefits from considerably more active duty man months of service from apprentices. From a sample of AAP MOSs, 15.9 percent of those eligible participate and 1.42% completed the program. This suggests that the AAP is accomplishing the participation goal, but completion rates are very low. Phase III will look at the obstacles to AAP completion.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT
☐ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS

21. ABSTRACT SECURITY CLASSIFICATION
UNCLASSIFIED

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (*Include Area Code*)	22c. OFFICE SYMBOL
Martin R. Walker	317-543-6880	ATRC-B

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted
All other editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

TECHNICAL NOTES

ON

ARMY APPRENTICESHIP PROGRAM EVALUATION STUDY

PHASE I - ANALYSIS OF AAP PARTICIPANTS

25 JUNE 1990

UNCLASSIFIED

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ACKNOWLEDGEMENTS

This study was sponsored by the Deputy Chief of Staff of Personnel Administration and Logistics (DCSPAL), U.S. Army Training and Doctrine Command (TRADOC) and performed by TRADOC Analysis Command - Fort Benjamin Harrison (TRAC-FBHN) with the assistance of Myrtle Williams of the DCSPAL staff. Ms Williams provided excellent support and direction for the study effort. The author of the report is Martin R. Walker from TRAC-FBHN.

I would especially like to thank Mr. Les Willis and Ms. Cristina Delmaria of the Defense Manpower Data Center for the outstanding support they provided to compile the data necessary for this report. Special thanks to Mr. Allen Pettie of the US Army Training Support Center at Ft Eustis for his support in providing Skill Qualification Test (SQT) scores.

SECURITY CHECKLIST

1. **TITLE OF STUDY:** Army Apprenticeship Program Evaluation Study, Phase I - Analysis of AAP Participants

2. **CLASSIFICATION:** This report is unclassified.

3. **DISSEMINATION:** There is no limitation on the dissemination of this report.

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GLOSSARY OF ACRONYMS

AAP	Army Apprenticeship Program
ACES	Army Continuing Education System
ACF	Army College Fund
ASVAB	Armed Services Vocational Aptitude Battery
ATSC	Army Training Support Center
BAT	Bureau of Apprenticeship and Training
DA PAMS	Department of Army Pamphlets
DCSPAL	Deputy Chief of Staff Personnel Administration and Logistics
DCST	Deputy Chief of Staff Training
DMDC	Defense Manpower Data Center
DOL	Department of Labor
EEA	Essential Element of Analysis
EMF	Enlisted Master File
ETS	End Term of Service
GED	General Education Development
IPR	In Progress Review
MACOM	Major Area Command
MOS	Military Occupation Specialty
NPS	Non-Prior Service
PSY	Professional Staff Years
SQT	Skill Qualification Test
SPSS	Statistical Package for the Social Sciences
TAAPD	Total Army Apprenticeship Program Database
TAPC	Total Army Personnel Command
TRAC-FBHN	TRADOC Analysis Command - Fort Benjamin Harrison
USAREC	United States Army Recruiting Command

FORWARD

TRAC-FBHN developed a three phase study methodology to identify the benefits that the Army Apprenticeship Program (AAP) provides to soldiers, the Army, and to the civilian workforce. The first phase of the study evaluated historic data on soldiers who participated in the AAP. The second phase was a survey effort to determine the attitudes and perceptions of those soldiers participating or who have participated towards the value of the AAP. The third phase, determined the operational problems and deficiencies inherent with the AAP and identified the corrective actions needed to revise the AAP.

5. METHODOLOGY. The study required a massive data collection effort on the part of the Defense Manpower Data Center (DMDC) and the US Army Training Support Center (ATSC). Enlisted Master File (EMF) and the Skill Qualification Test (SQT) databases were matched with data in the Total Army Apprenticeship Program database (TAAPD). The data for all Non-Prior Service (NPS) individuals entering the Army between 1979 to 1988 was separated into one of two groups: AAP or non-AAP participant. The demographic and job performance characteristics were compared for those soldiers who participated in the AAP to those NPS accessions who had not participated in the AAP.

6. CONCLUSIONS.

a. Demographic Characteristics of Apprentices. Army apprentices are predominantly male even though nearly all MOSs in the AAP are available to females. The percentage of female apprentices in the AAP is slightly over half that of the NPS accession population (6.8% versus 13.4%). AAP participants are slightly older when they joined the Army (average age is 20 for the AAP group compared to 19.8 years old for the non-AAP group). The AAP group had relatively the same percentage of mental category of I-IIIAs, fewer IIIBs, and a higher percentage of mental category IVs when compared to the non-AAP group. AAP participants were slightly less educated than the NPS accession population. Army apprentices enlisted for longer terms of service, received fewer enlistment cash bonuses, and signed-up for more educational incentives than soldiers from the NPS accession population.

b. Performance Attributes of Apprentices. The SQT is the US Army's principal diagnostic instrument for evaluation of individual training, job performance, and readiness. Although apprentices were previously determined to have slightly lower mental aptitudes and education attainment, apprentices performed higher on the SQT at nearly all skill levels when compared to those soldiers who did not participate in the AAP. Apprentices at skill levels 1 scored significantly higher on the SQT than non-apprentices in the same MOSs. The differences between groups diminishes as skill level increases. Furthermore, fewer apprentices failed to meet the minimum standard on the SQT when compared to non-apprentices.

c. Benefits Gained by the Army. DMDC conducted attrition and retention studies of apprentices by comparing apprentices to non-apprentices from the NPS accession population. These studies determined that a smaller percentage of apprentices were forced to separate from the Army (25.1% AAP versus 37.8% NPS). The largest difference in reasons why soldiers were forced to separate was in their "failure to meet minimum behavioral and performance standards" (11.7% AAP compared to 23.1% NPS). Apprentices leave the Army at lower rates than soldiers from the

EXECUTIVE SUMMARY

1. INTRODUCTION. An apprenticeship, in its simplest terms, involves scheduled on-the-job training and experience under appropriate supervisory guidance, combined with technical instruction in subjects related to the trade. As a result of a July 1975 agreement between the Secretaries of the Army and the US Department of Labor (DOL), the Army has developed apprenticeship programs for all Military Occupation Specialty (MOS) considered to have civilian counterpart apprenticeship occupations, and registered them with the DOL, Bureau of Apprenticeship and Training (BAT). TRADOC service schools are sponsors for AAP occupations for which they have proponent MOSs. Currently, soldiers serving in over 180 different Army MOSs can participate in the Army Apprenticeship Program (AAP). The goals for the AAP, from Army Regulation 621-5, 25 July 1986, are: to enable enlisted soldiers to record and document specific skills acquired on active duty; to assist military supervisors in making management decisions and work assignments based on documented work experience; to assist enlisted soldiers in obtaining civilian employment; and to provide a recruiting incentive for MOSs that have related apprenticeship skills. As described in the forward, the AAP Evaluation study was a three phase study effort. The overall study effort was to identify the benefits that the AAP provides to soldiers, the Army, and to the civilian workforce.

2. PURPOSE. The purpose of this study report is to describe the findings of the first phase of the AAP evaluation. The objective of the first phase of the AAP study was to identify the possible benefits that may be gained by the Army from offering the AAP.

3. TASKING. In November 1988, the Deputy Chief of Staff Personnel, Administration, and Logistics (DCSPAL) requested a study of the AAP. A review by DCSPAL and HQ DA staff placed the AAP under increased scrutiny due to the lack of measures to evaluate program effectiveness. Without benefit of a through evaluation of AAP historical data, some believe that the cost of administering the AAP outweigh the benefits obtained from offering the program.

4. SCOPE. The first phase of this study effort consisted of an evaluation of historic data on soldiers who have participated in the AAP. The study identified the demographic characteristics of those soldiers attracted to the program, and their performance characteristics. Phase I determined the benefits that the Army may gain from offering the AAP.

NPS accession population. Apprentices reenlist at higher rates and stay on active duty longer than soldiers from the NPS accession population. Therefore, the Army benefits from considerably more active duty man months of quality service from apprentices (54 months AAP compared to 36 months NPS).

d. Responsiveness to the AAP.

(1) The percentage of those soldiers who participated in the AAP varies between 36 percent for metal workers to slightly less than 10 percent for multi-channel communication system operators. On the average, for a sample of the top 10 MOSs, 15.9 percent of those eligible participate in the AAP. One of the objectives for the program, as per, AR 621-5, dated 25 July 86, was an annual enrollment of 15 percent. The sample data idndicates that the AAP is accomplishing the participation goal of 15 percent of those eligible.

(2) The percentage of apprentices that completed the AAP varies between 3.2 percent for food service specialist to no program completion for some MOSs. As of December 1989, none of the apprentices in MOS 51B (carpentry and masonry specialist) has completed the AAP. Of the 29,134 apprentices from the top 10 MOSs who participated in the program, only 414 AAP completions were recorded. This represents a mere 1.42% completion rate. Therefore, completion rates for the AAP are very low. The phase III study report looks at the deficiencies associated with the AAP.

CHAPTER 1 - INTRODUCTION AND BACKGROUND

1. Study Background.

a. Apprenticeships. "At the present moment, America has need for skilled workers, a need that will increase in the coming years." These were the words of Harry Kursh written in 1958 about our country's increasing need for skilled workers as we approached the 1960s. He warned of a shortage of highly skilled and specialized workers due to the expansion of automation. Due to today's competitive industrial environment, this warning is as true today as it was 30 years ago. Elizabeth Dole, the Secretary of Labor, has stated that "America's workforce is in a state of unreadiness, unready for the new jobs, unready for the new realities and unready for the new challenges of the 90's." Industry has found that one of the best ways to train young people to become skilled workers is through apprenticeships -- on-the-job experience, acquired under direct supervision of a qualified craftsman.

b. Army Apprenticeship Program (AAP).

(1) The Army is committed to having soldiers who continue their educational pursuits while in the service. Education programs directly support the total Army goals by laying a foundation of skills and values fundamental to military learning. Through the achievement of individual educational goals, soldiers acquire the skills required to achieve excellence. The AAP is a prescribed period of work experience, where a soldiers learns a trade through on-the-job training and related instruction. As a result of a July 1975 agreement between the Secretaries of the Army and the US DOL, the Army developed apprenticeship programs for all MOSs considered to have civilian counterpart apprenticeship occupations and registered them with DOL, BAT. The AAP adheres to DOL standards for the required number of hours of work experience and related instruction for a trade. Currently, soldiers serving in over 180 different Army MOSs can participate in the AAP. The Army offers a vast variety of occupations that soldiers can apprentice in, ranging from Army cooks to mechanics to highly specialized electronic repairers. Table 1 demonstrates the diversity of these occupations by highlighting the top twenty AAP MOSs. The table displays, as of December 89, the number of active AAP participants and the percentage of active AAP from each MOS (i.e., 11.1% of active participants were Food Service Specialists).

TABLE 1. ACTIVE AAP PARTICIPANTS BY MOS

#	MOS	JOB TITLE	ACTIVE AAP		CUM
			NUMBER	PERCENT	TOTAL
1	94B	FOOD SERVICE SPECIALIST	3,123	11.1%	11.1%
2	63B	LIGHT WHEELED VEHICLE MECHANIC	2,580	9.2%	20.3%
3	31M	MULTICHANNEL COMM SYSTEMS OPERATOR	766	2.7%	23.0%
4	62B	CONSTRUCTION EQUIPMENT MECHANIC	761	2.7%	25.7%
5	62E	HEAVY CONSTRUCTION EQUIP OPERATOR	667	2.4%	28.1%
6	67N	UTILITY HELICOPTER REPAIRER	662	2.4%	30.4%
7	63H	TRACK VEHICLE REPAIRER	596	2.1%	32.5%
8	51B	CARPENTRY AND MASONRY SPECIALIST	560	2.0%	34.5%
9	36C	WIRE SYSTEM INSTALLER	529	1.9%	36.4%
10	44B	METAL WORKER	511	1.8%	38.2%
11	76W	WATER TREATMENT SPECIALIST	509	1.8%	40.0%
12	72E	TACTICAL TELECOM CENTER OPERATOR	501	1.8%	41.8%
13	67V	SCOUT HELICOPTER REPAIRER	469	1.7%	43.5%
14	31V	UNIT LEVEL COMMUNICATIONS REPAIRER	444	1.6%	45.0%
15	05C	SINGLE CHANNEL RADIO OPERATOR	434	1.5%	46.6%
16	63W	WHEELED VEHICLE MECHANIC	428	1.5%	48.1%
17	72G	AUTOMATIC DATA TELECOM OPERATOR	415	1.5%	49.6%
18	64C	MOTOR TRANSPORTATION OPERATOR	403	1.4%	51.0%
19	52C	UTILITIES EQUIPMENT REPAIRER	394	1.4%	52.4%
20	82C	FIELD ARTILLERY SURVEYOR	373	1.3%	53.7%

(2) A purpose of the AAP is to develop highly skilled, Army-oriented journeymen who will continue to use their technical skills and knowledge in the Army. The AAP provides a vehicle through which a soldier can document industry-related Army-acquired training and instruction in a manner acceptable to industry. Thus, soldiers earn vocational credentials equivalent to their contemporaries in comparable civilian occupations. Soldiers who document the required training hours as specified by the DOL and approved by the proponent TRADOC service school receive a certificate showing completion of the AAP. The DOL certificate of completion should aid the soldier in the transition from military service into a civilian occupation or, if a soldier decides to continue an Army career, the DOL apprenticeship certificate should be an additional measure of soldier expertise in his/her MOS. For many trades, apprentice, journeyman, craftsman, and master craftsman are all considered career ladders that a worker must strive to attain. Once apprentices complete their program, they become journeymen, certified proficient in there occupation. A letter of partial completion along with documentation showing work processes and related instruction completed, should aid a soldier in the transfer from AAP to a civilian sponsored apprenticeship program.

(3) The goals of the AAP have evolved, the AAP in Army Regulation 621-5, 25 July 1986, Army Continuing Education System (ACES) are consistent with 10 US Code, Section 4302, and Department of Defense Directive, Number 1322.8, July 23, 1977. The goals are to:

Enable enlisted soldiers to record and document specific skills acquired on active duty;

Assist military supervisors in making management decisions and work assignments based on documented work experience;

Assist enlisted soldiers in obtaining civilian employment and;

Provide a recruiting incentive for MOSs that have related apprenticeship skills.

(4) At the request of the Deputy Chief of Staff Personnel, Administration, and Logistics (DCSPAL), TRADOC Analysis Command - Ft. Benjamin Harrison (TRAC-FBHN) conducted an evaluation of the AAP. The purposes of the AAP evaluation study were to identify the benefits that the AAP provides to soldiers, the Army, and to evaluate the cost of offering the program.

2. Problem.

a. A recent review by ACES management has placed the AAP under increased scrutiny due to the lack of measures to evaluate program effectiveness. This review focused on the original purpose for the AAP, policy, goals, and the Total Army Goals.

b. Currently, more than 14 Major Commands (MACOM) administer the AAP through more than 200 Army Education Centers. Some believe that the cost of administering the program outweighs the benefits obtained from offering the program.

3. Objective. The purpose of this interim study report is to describe the findings of the first phase of the AAP evaluation. The objective of the first phase of the study was to identify the possible benefits that may be gained by the Army from offering the AAP.

4. Scope. The first phase of this study effort consisted of an evaluation of historic data on soldiers who have participated in the AAP. An identification of those soldiers attracted to the program and their performance characteristics were evaluated. A cursory look at the demographic characteristics of soldiers who participated in the AAP was conducted. In determining one aspect of program effectiveness, the study ascertained how responsive soldiers have been to the program. The phase I study effort determined, through use of historic data, the benefits that the

Army may gain from offering the AAP. While it is recognized that participation in the AAP and soldier performance is not necessarily a cause-and-effect type relationship, the AAP may be one of many factors internal to the Army that stimulates increased motivation and job satisfaction which translates into increased overall soldier performance. An analysis of historic data allows the Army to determine if the AAP is attracting high quality (top soldiers) from apprenticeable MOSs. If the results provide confirming evidence, the Army can investigate new management initiatives aimed at retaining these soldiers.

5. Methodology.

a. The study required a massive data collection effort on the part of the Defense Manpower Data Center (DMDC) and the US Army Training Support Center (ATSC).

(1) The Enlisted Master File (EMF) database was matched with data in the Total Army Apprenticeship Program Database (TAAPD). The data for all NPS soldiers entering the Army between 1979 to 1988 was segregated into one of two groups based on AAP participation status. The DMDC conducted an attrition and retention study on those 54,531 soldiers who joined the AAP during their first enlistment term. DMDC also conducted a similar attrition and retention study for all Army accessions, i.e., 1,254,072 soldiers, during the same time-frame.

(2) The FY87 and FY88 SQT database from ATSC was matched with data in the TAAPD database. The data was segregated into one of two groups based on AAP participation status.

b. The demographic, attrition, retention, and performance characteristics for those soldiers who have participated in the AAP were compared to soldiers who have not participated in the AAP.

6. Limitations. The first phase of the overall AAP evaluation study was conducted within the .6 Professional Staff Years (PSY) allocated for the study. The amount of PSY for this effort was allocated among the following organizations: .2 PSY - DMDC, US Army ATSC - .1 PSY and .3 PSY TRAC-FBHN.

7. Analytical Techniques. Descriptive and inferential statistics were used to determine whether differences exist in demographic and performance data.

a. Descriptive statistics include measures of central tendency (means), measures of dispersion or variance (standard deviations), and frequency distributions. The descriptive statistics are used to summarize the quantitative data into a form easily comprehended. The data are also summarized and presented in graphic form.

b. Inferential statistics are used to generalize sample results to the population being examined. They include probability assessments about a sample result. Hypothesis testing is used in this study to determine whether the difference in survey responses among groups is too great to occur simply as a matter of chance. If a difference between the AAP and Non-AAP group is too great, then the hypothesis of equality is rejected.

8. Phase I - Essential Elements of Analysis (EEA).

a. What are the demographic characteristics of soldiers participating in the AAP?

b. What are the performance attributes of the soldiers once they are in the AAP and how do they compare to soldiers who have not participated in the AAP?

c. What benefits to the Army may be gained by offering the AAP?

d. How responsive have soldiers been to the AAP?

(1) What percentage of soldiers participate in the AAP of those eligible? (AAP goal is 15% of soldiers eligible.)

(2) What percentage of soldiers have completed and received an the AAP certificate?

(3) How do these percentages compare to other Army in-service education programs?

CHAPTER 2 - AAP PARTICIPANTS

1. EEA #1 - What are the demographic characteristics of soldiers who participate in the AAP?

a. Demographics. The evaluation method selected for this EEA was to compare the demographic and enlistment characteristics of apprentices to soldiers who accessed in the Army during fiscal year 1979 through 1988. An accession cohort refers to the group of individuals who have enlisted into the Army in particular fiscal year. For this comparison, the Non-Prior Service (NPS) accession cohort who did not elect to participate in the AAP is the control group. The following key demographic variables which were used to profile the two populations (discussed below): gender; age at enlistment; Armed Services Vocational Aptitude Battery (ASVAB); race/ ethnicity; educational level at enlistment; and geographic region in which a soldier entered the Army.

b. Gender. The MOSs that currently comprise the AAP are those in traditional male-oriented technical trade occupations. While nearly all apprenticeable MOSs are available to females, as table 2 shows, more soldiers who have participated in the AAP are males. The percentage of females in AAP MOSs is slightly over half of that of the NPS accession population, (6.8 percent in the AAP compared to 13.34 percent NPS accession population).

TABLE 2. ARMY NON-PRIOR SERVICE ACCESSIONS VERSUS AAP PARTICIPANTS BY GENDER (1979-1988)

GENDER CATEGORY	AAP ONLY	AAP PERCENT	NPS ACCESSION	NPS PERCENT
MALE	50,811	93.18%	1,086,783	86.66%
FEMALE	3,720	6.82%	167,289	13.34%
TOTAL	54,531	100.00%	1,254,072	100.00%

c. Age at Enlistment. Table 3 shows the difference in age categories between AAP soldiers and the NPS accession population. AAP participants were found to be slightly older than the NPS accession population. The average age of soldiers enlisting into the Army was 19.95 years for AAP soldiers compared to 19.77 years for the NPS accession population.

TABLE 3. ARMY NON-PRIOR SERVICE ACCESSIONS VERSUS AAP PARTICIPANTS BY AGE (ARMY ENTRY, 1979-1988)

AGE CATEGORY	AAP ONLY	AAP PERCENT	NPS ACCESSION	NPS PERCENT
17-19	33,798	61.98%	785,448	62.63%
20-24	15,792	28.96%	381,652	30.43%
25-29	3,769	6.91%	69,183	5.52%
> 30	1,169	2.14%	17,728	1.41%
UNKNOWN	3	0.01%	61	0.00%
TOTAL	54,531	100.00%	1,254,072	100.00%
AVERAGE AGE	19.95 years old		19.77 years old	

d. Armed Services Vocational Aptitude Battery (ASVAB) Scores. The ASVAB is used by the services as an indicator of success in a military occupation. The US Army Recruiting Command (USAREC) uses ASVAB scores as a means of screening individuals before allowing them entry into the Army. USAREC uses ASVAB scores to establish monthly missions for Army recruiters. Table 4 shows the differences in the ASVAB categories between apprentices and the NPS accession population. As the table shows, the percentage of apprentices in mental categories I-IIIA and IIIB is slightly less than that of the NPS accession population. Among apprentices, there is a greater percentage of mental category IV soldiers, compared to the NPS accession population.

TABLE 4. ARMY NON-PRIOR SERVICE ACCESSIONS VERSUS AAP PARTICIPANTS BY MENTAL CATEGORY

ASVAB CATEGORY	AAP PART	PERCENT	NPS ACCESSION	PERCENT
I-IIIA	26,090	47.84%	604,157	48.18%
IIIB	14,117	25.89%	370,166	29.52%
IV	13,750	25.22%	276,805	22.07%
UNKNOWN	574	1.05%	2,944	0.23%
TOTAL	54,531	100.00%	1,254,072	100.00%

e. Racial and Ethnic Categories. Table 5 shows that a higher percentage of black soldiers, and fewer white and hispanic soldiers are participating in the AAP, as compared to the percentage in the NPS accession population.

TABLE 5. ARMY NON-PRIOR SERVICE ACCESSIONS VERSUS AAP PARTICIPANTS BY RACE (1979-1988)

RACIAL CATEGORY	AAP ONLY	AAP PERCENT	NPS ACCESSION	NPS PERCENT
WHITE	35,349	64.82%	832,019	66.35%
BLACK	10,487	19.23%	215,846	17.21%
HISPANIC	6,498	11.92%	159,282	12.70%
OTHER	2,197	4.03%	46,925	3.74%
TOTAL	54,531	100.00%	1,254,072	100.00%

f. Educational Level at Enlistment. Table 6 profiles the educational backgrounds of apprentices and soldiers in the NPS accession population. As shown in the table, a higher percentage of apprentices were non-high school graduates or possessed a General Education Development (GED) prior to enlisting into the Army. Apprentices have attained a slightly lower education level at entry compared to the overall population of NPS accessions.

TABLE 6. ARMY NON-PRIOR SERVICE ACCESSIONS VERSUS AAP PARTICIPANTS BY EDUCATION LEVEL AT ENTRY (1979-1988)

EDUCATION LEVEL AT ENTRY	AAP ONLY	AAP PERCENT	NPS ACCESSION	NPS PERCENT
NON HIGH SCHOOL GRADUATE	8,691	15.94%	179,632	14.32%
GENERAL ED DIPLOMA	2,416	4.43%	45,491	3.63%
HIGH SCHOOL GRADUATE	40,024	73.40%	932,930	74.39%
SOME COLLEGE	2,895	5.31%	70,272	5.60%
COLLEGE GRADUATE	505	0.93%	25,747	2.05%
TOTAL	54,531	100.00%	1,254,072	100.00%

g. Geographical Region. Table 7 identifies the census regions where soldiers initially entered the Army. As the table shows, there are very small differences between the location where apprentices and the NPS accession population entered the Army. The data suggests that soldiers participating in the AAP are from high density urban areas i.e., Northeast, Midwest, and Pacific regions. Furthermore, there is an association in terms of higher demand of jobs in these areas.

TABLE 7. ARMY NON-PRIOR SERVICE ACCESSIONS VERSUS AAP PARTICIPANTS BY CENSUS REGION UPON ENTRY (1979-1988)

CENSUS REGION	AAP ONLY	AAP PERCENT	NPS ACCESSION	NPS PERCENT
NEW ENGLAND	2,468	4.53%	50,635	4.04%
MID ATLANTIC	7,810	14.32%	160,963	12.84%
N.E. CENTRAL	11,186	20.51%	248,499	19.82%
N.W. CENTRAL	3,870	7.10%	93,879	7.49%
S. ATLANTIC	10,769	19.75%	249,488	19.89%
S.E. CENTRAL	3,726	6.83%	91,989	7.34%
S.W. CENTRAL	4,358	7.99%	125,399	10.00%
MOUNTAIN	2,739	5.02%	64,419	5.14%
PACIFIC	6,675	12.24%	145,129	11.57%
OTHER	835	1.53%	20,991	1.67%
UNKNOWN	95	0.17%	2,681	0.21%
TOTAL	54,531	100.0%	1,254,072	100.0%

2. Army Enlistment Option. The Army uses enlistment options to expand the recruiting market by offering incentives to youth to attract those who might not otherwise be interested in serving their country.

a. Term of Service. Table 8 compares the term of service for soldiers who participate in the AAP to those soldiers in the NPS accession population. As the table shows, AAP soldiers enlist for longer terms of service that the majority of soldiers who eventually participated in the AAP enlisted for a 4 year term of service. This may be explained by any one or all of the following reasons: AAP MOSs have longer training periods (thus, they require a longer Army payback or enlistment term); enlisting for a two year term does not give the soldier enough time to complete the AAP; and the length of time needed to become aware of the AAP precludes most two year soldiers from joining the program. The average enlistment term for AAP soldiers was 3.55 years compared to an average of 3.32 year for the NPS accession population.

TABLE 8. ARMY NON-PRIOR SERVICE ACCESSIONS VERSUS AAP PARTICIPANTS BY TERM OF SERVICE UPON ENTRY (1979-1988)

TERM OF SERVICE	AAP ONLY	AAP PERCENT	NPS ACCESSION	NPS PERCENT
2 YR	1,079	1.98%	75,255	6.00%
3	24,775	45.43%	708,656	56.51%
4	26,882	49.30%	462,363	36.87%
>4	1,293	2.37%	6,524	0.52%
UNKNOWN	502	0.92%	1,274	0.10%
TOTAL	54,531	100.0%	1,254,072	100.0%
AVERAGE TERM	3.55 years		3.32 years	

b. Other Options. Education incentives and the enlistment bonus option are two of the most effective Army recruiting options. These options have been particularly effective at both attracting youth into the Army, and as a management tool to channel youth into military occupations where the greatest demand exists for soldiers. Youth enlisting in the Army have the choice of selecting the type of training and occupation they desire. The Army strives to manage this by offering enlistment incentives for targeted MOSs.

(1) Based on historic data, table 9 reveals that soldiers who have joined the AAP have received fewer enlistment bonuses (6.55 percent) than those soldiers in the NPS accession population (15.12 percent). This can partially be explained because enlistment bonuses are used to channel soldiers in MOSs that may be difficult to fill, such as combat arms positions. Combat positions, such as 11B infantryman, are not a part of the AAP because they have no civilian sector counterpart.

(2) Conversely, a larger percentage of AAP soldiers were found to be eligible for the educational enlistment incentives (i.e., Veterans Education Assistance Program and Army College Fund), 28.98 percent for AAP soldiers versus 16.11 percent for the NPS accession population. AAP soldiers have a greater opportunity to pursue education opportunities when they transition out of the Army.

(3) Job Related Options. The table 9 lists the occupation related enlistment options that the Army offers. Contrary to expectations, fewer AAP soldiers signed for the training of choice enlistment option (36.5 percent for AAP soldiers compared to 42.09 percent for the NPS population).

(4) Location Related Options. The Army offers a number of location related options. As shown in the table 9, the NPS accession population had a higher propensity to sign for location related enlisted options than the AAP soldiers.

TABLE 9. ENLISTMENT OPTIONS TAKEN BY NPS ACCESSIONS VERSUS AAP PARTICIPANTS

ENLISTMENT OPTIONS	AAP ONLY	NPS ACCESSION	DIFF-ERENCE
EDUCATION INCENTIVE	28.98%	16.11%	-12.87%
ENLISTMENT BONUS	6.55%	15.12%	8.57%
JOB RELATED			
CIVILIAN ACQUIRED SKILLS PROGRAM	0.52%	0.33%	-0.19%
TRAINING OF CHOICE	36.50%	42.09%	5.59%
ELECTRIC WARFARE/CRYPTOLOGY	0.73%	1.63%	0.90%
ARMY COMMUNICATIONS COMMAND	1.08%	0.61%	-0.47%
AIRBORNE	3.97%	8.67%	4.70%
LOCATION RELATED			
STATION OF CHOICE	15.23%	17.69%	2.46%
UNIT OF CHOICE	0.91%	9.74%	8.83%
SPECIAL UNIT ENLISTMENT	8.62%	8.15%	-0.46%

CHAPTER 3 - PERFORMANCE ATTRIBUTES

1. Skill Qualification Test (SQT) Scores.

a. The SQT is the US Army's principal diagnostic instrument for evaluation of individual training. The SQT is a performance-based, criterion-referenced test of tasks critical to soldiers' duty positions -- tasks detailed in the Soldier's Manuals. The SQT is an annual assessment of a soldier's ability to perform 25 to 35 selected tasks associated with his/her MOS. These tasks are selected by the TRADOC service school which is the proponent for that MOS.

b. The SQT is composed of both written and hands-on tasks. The configuration of the SQT varies by MOS. The typical SQT is composed of three main components: job site; hands-on; and skill components. The job site component consists of "soldier tasks" common to most MOS's, such as marksmanship and physical fitness tasks. The hands-on component of the tests examines the actual performance of selected MOS critical tasks. The third portion and the only written section of the SQT is the skill component. The skill component is made up of tasks that can not easily be tested in a hands-on type of exam, such as the application of numerical skill, map reading, etc.

c. A prior study of the Army SQT showed a high positive correlation between the SQT and supervisory ratings of overall job performance. In 1981 a study entitled "Supervisor Ratings as a Criteria for Skill Qualification Test," demonstrated that supervisors rating of overall job performance were correlated with the SQT. The study determined there was:

> "A high positive correlation (R=.74) for lower skill level 1 soldiers. The correlation was significantly lower for skill level 2 (R=.64) and skill level 3 (R=.35) soldiers. The high positive correlation at skill level 1 indicates that the SQT is a valid instrument for discrimination between MOS performers and non-performers at skill level 1."

d. Soldiers within each Army MOS are examined based on their achieved skill level. The skills required of a soldier become progressively more difficult as the soldier's rank increases. In other words, as table 10 shows, a soldier's skill level is a function of the soldiers military rank.

TABLE 10. RELATIONSHIP BETWEEN GRADE AND SKILL LEVEL

GRADES	SKILL LEVEL
E 1-4	1
E 5	2
E 6	3
E 7	4
E 8-9	5

e. EEA #2 - What are the performance characteristics of soldiers in the AAP and how do they compare to other soldiers?

(1) To test the premise that the Army achieves a higher degree of job related performance from soldiers who participate in the AAP, we had to identify variables that related to job performance. The SQT is the Armys' key indicator of job performance or readiness. We wanted to determine if performance on the SQT differed for those soldiers participating in the AAP compared to the larger population of soldiers who did not participate in the AAP. Thus, the first performance attribute investigated was SQT scores. The reasoning is that soldiers who participate in the AAP should be more interested in their work and take a more active interest in their education and careers. While the data on all MOSs does exist, because of the time and effort required, the analysis was limited to only the top five active MOSs currently in the AAP. These top five apprenticeable MOSs represent nearly 30% of all of the soldiers who were actively participating in the AAP as of Jan 1989.

(2) Food Service Specialist - MOS 94B. Food service specialist has the largest number of soldiers enrolled in the AAP. There were, as of January 1989, 3,123 cooks which represented 11.1% of the program's active participants. As displayed in table 11, soldiers in this MOS who participate in the AAP consistently scored higher on their 1987 and 1988 SQT at all skill levels, than those soldiers who did not participate in the AAP. For instance in 1987, skill level one apprentices scored 72.28 on their SQT, while other soldiers in the same MOS and skill level scored 69.29. Skill level one -- cook apprentices -- scored 4.3% higher on their SQT than other soldiers in the same MOS and skill level who were not members of the AAP.

TABLE 11. FY87 & FY88 SQT SCORES FOR MOS 94B - FOOD SERVICE SPECIALIST BY AAP STATUS

SKILL LEVEL	GROUP MOS 94B	FY 87 AVG SQT/NUMBER	FY 88 AVG SQT/NUMBER
1	AAP SOLDIERS	72.28 / 987*	74.07 / 888*
	NON AAP SOLDIERS	69.29 / 6428	70.41 / 7737
2	AAP SOLDIERS	78.25 / 607*	75.11 / 602*
	NON AAP SOLDIERS	77.23 / 1647	73.86 / 1728
3	AAP SOLDIERS	73.11 / 676*	78.39 / 641
	NON AAP SOLDIERS	71.53 / 1594	78.13 / 1534
4	AAP SOLDIERS	76.15 / 323	83.02 / 371*
	NON AAP SOLDIERS	75.08 / 1284	81.33 / 1254

* Statistically Significant differences (ANOVA .95% confidence level)

(3) Another important indicator of readiness is the percentage of soldiers meeting the standard of 60 on the SQT. The percentage of soldiers who failed the SQT in 1987 was nearly twice the rate for non-apprentices (9.5%) compared to cook apprentices (5.0%), are shown in table 12. Those who fail the SQT require remedial instruction and must retake the test. Soldiers who consecutively fail the SQT, are candidates to be discharged through the Army Quality Management Program.

TABLE 12. PERCENTAGE OF MOS 94B SOLDIERS WHO FAILED THE ARMY'S SQT (1987 & 1988)

SKILL LEVEL	GROUP MOS 94B	FY 87 NUMBER/PERCENT	FY 88 NUMBER/PERCENT
1-4	AAP SOLDIERS	129 / 5.0%	58 / 3.4%
1-4	NON AAP SOLDIERS	1042 / 9.5%*	843 /11.6%*

* Statistically Significant differences (Chi-Square .95% confidence level)

(4) Light Wheeled Vehicle Mechanic - MOS 63B. Light Wheeled Vehicle Mechanics MOS has the second largest number of AAP participants. There were, as of January 1989, 2,580 light vehicle mechanics in the AAP. This number represents 9.2% of the programs' active participants. As displayed in table 13, soldiers who participate in the AAP, at skill levels 1 and 4, scored higher on their 1987 & 1988 SQT, than those soldiers who did not participate in the AAP. For instance in 1987, skill level one 63B apprentices scored 69.34 on their SQT, while other soldiers in the same MOS and skill level scored 66.53. Skill level one --light vehicle mechanics apprentices -- scored 4.2% higher on their SQT as compared to other soldiers in the same MOS and skill level who were not members of the AAP.

TABLE 13. FY87 & FY88 SQT SCORES FOR MOS 63B - LIGHT WHEELED VEHICLE MECHANIC BY AAP STATUS

SKILL LEVEL	GROUP MOS 63B	FY 87 AVG SQT/NUMBER	FY 88 AVG SQT/NUMBER
1	AAP SOLDIERS	69.34 / 824*	69.09 / 562*
	NON AAP SOLDIERS	66.53 / 7640	64.64 / 7309
2	AAP SOLDIERS	69.34 / 499	69.17 / 508
	NON AAP SOLDIERS	69.46 / 2055	69.54 / 2136
3	AAP SOLDIERS	84.90 / 404	76.49 / 480
	NON AAP SOLDIERS	84.32 / 1649	77.19 / 1903
4	AAP SOLDIERS	84.90 / 145	78.97 / 159
	NON AAP SOLDIERS	84.67 / 1142	77.91 / 1133

* Statistically Significant differences (ANOVA .95% confidence level)

(5) The percentage of MOS 63B soldiers who failed the SQT in 1987 was 8.0 percent for apprentices, compared to 13.8 percent for non-apprentices, are shown in table 14. The magnitude of differences is even greater for those taking the test in FY88 (8.8 percent for apprentices compared to 19.2 percent for non-apprentices).

TABLE 14. PERCENTAGE OF MOS 63B SOLDIERS WHO FAILED THE ARMY'S SQT (1987 & 1988)

SKILL LEVEL	GROUP MOS 63B	FY 87 NUMBER/PERCENT	FY 88 NUMBER/PERCENT
1-4	AAP SOLDIERS	149 / 8.0%	150 / 8.8%
1-4	NON AAP SOLDIERS	1728 /13.8%*	2402 /19.2%*

* Statistically Significant differences (Chi-Square .95% confidence level)

(6) Multichannel Communication Operator - MOS 31M. Multichannel communication operator MOS has the third largest number of AAP participants in January 1988. There were 766 multichannel communication operators active in the AAP. This represents 2.7% of the program's active participants. As displayed in table 15, soldiers who participate in the AAP, at skill levels 1 to 3, scored higher on their 1987 & 1988 SQT compared to soldiers who did not participate in the AAP. For instance in 1987, skill level one 31M apprentices scored 80.95 on their SQT, while other soldiers in the same MOS and skill level scored 77.53. Skill level one --multichannel communication operator apprentices -- scored 4.4% higher on their SQT than other soldiers in the same MOS and skill level who were not members of the AAP.

TABLE 15. FY87 & FY88 SQT SCORES FOR MOS 31M - MULTICHANNEL COMMUNICATION OPERATOR BY AAP STATUS

SKILL LEVEL	GROUP MOS 31M	FY 87 AVG SQT/NUMBER	FY 88 AVG SQT/NUMBER
1	AAP SOLDIERS	80.95 / 226*	79.61 / 203*
	NON AAP SOLDIERS	77.53 / 3419	76.10 / 4404
2	AAP SOLDIERS	84.71 / 247	87.29 / 201
	NON AAP SOLDIERS	84.41 / 1620	87.00 / 1377
3	AAP SOLDIERS	83.23 / 135	80.17 / 171
	NON AAP SOLDIERS	82.83 / 725	79.97 / 851

* Statistically Significant differences (ANOVA .95% confidence level)

(7) The percentage of MOS 31M soldiers who failed the SQT in 1987 was 1.2 percent for apprentices compared to 3.5 percent for non-apprentices, are shown in table 16. The magnitude of differences is even greater for those taking the test in FY88, 1.6 percent for apprentices compared to 4.3 percent for non-apprentices.

TABLE 16. PERCENTAGE OF MOS 31M SOLDIERS WHO FAILED THE ARMY'S SQT (1987 & 1988)

SKILL LEVEL	GROUP MOS 31M	FY 87 NUMBER/PERCENT	FY 88 NUMBER/PERCENT
1-4	AAP SOLDIERS	7 / 1.2%	9 / 1.6%
1-4	NON AAP SOLDIERS	204 / 3.5%*	283 / 4.3%*

* Statistically Significant differences (Chi-Square .95% confidence level)

(8) Construction Equipment Mechanic - MOS 62B. There were 761 construction equipment mechanics active in the AAP in January 1988. This represents 2.7% of the programs active participants. As displayed in table 17, soldiers who participate in the AAP, at skill levels 1 to 4, scored higher on their 1987 & 1988 SQT, compared to soldiers who did not participate in the AAP. For instance in 1987, skill level one 62B apprentices scored 71.90 on their SQT, while other soldiers in the same MOS and skill level scored 69.07. Skill level one --construction equipment mechanic apprentices -- scored 4.10% higher on their SQT than other soldiers in the same MOS and skill level who were not members of the AAP.

TABLE 17. FY87 & FY88 SQT SCORES FOR MOS 62B - CONSTRUCTION EQUIPMENT MECHANIC BY AAP STATUS

SKILL LEVEL	GROUP MOS 62B	FY 87 AVG SQT/NUMBER	FY 88 AVG SQT/NUMBER
1	AAP SOLDIERS	71.90 / 338*	79.37 / 298*
	NON AAP SOLDIERS	69.07 / 1587	76.40 / 1786
2	AAP SOLDIERS	70.36 / 171	80.33 / 177
	NON AAP SOLDIERS	69.73 / 479	79.94 / 504
3	AAP SOLDIERS	71.02 / 117	78.44 / 133
	NON AAP SOLDIERS	70.88 / 273	78.06 / 299
4	AAP SOLDIERS	66.96 / 45	74.56 / 43*
	NON AAP SOLDIERS	67.20 / 254	70.69 / 198

* Statistically significant differences (ANOVA .95% confidence level)

(9) The percentage of MOS 62B soldiers who failed the SQT in 1987 was 11.2 percent for apprentices compared to 17.2 percent for non apprentices, are shown in table 18. As table 17 shows there was a striking improvement in the SQT scores and percentage of soldiers who passed the SQT standard between 1987 to 1988. The percentage of soldiers failing the SQT standard in 1988 was 2.3 percent for apprentices compared to 4.5 percent for non-apprentices.

TABLE 18. PERCENTAGE OF MOS 62B SOLDIERS WHO FAILED THE ARMY'S SQT (1987 & 1988)

SKILL LEVEL	GROUP MOS 62B	FY 87 NUMBER/PERCENT	FY 88 NUMBER/PERCENT
1-4	AAP SOLDIERS	75 /11.2%	15 /10.6%
1-4	NON AAP SOLDIERS	445 /17.2%*	126 /15.9%*

* Statistically Significant differences (Chi-Square .95% confidence level)

(10) Heavy Construction Equipment Operator - MOS 62E. There were 667 heavy construction equipment operators active in the AAP in January 1989. This represents 2.4% of the programs active participants. As displayed in table 19, soldiers who participate in the AAP, at skill levels 1 and 2, scored higher on their 1987 & 1988 SQT, than those soldiers who did not participate in the AAP. For instance in 1987, skill level one 62E apprentices scored 76.50 on their SQT, while other soldiers in the same MOS and skill level scored 75.16. Skill level one -- construction equipment mechanic apprentices -- scored 2.0% higher on their SQT than other soldiers in the same MOS and skill level who were not members of the AAP.

TABLE 19. FY87 & FY88 SQT SCORES FOR MOS 62E - HEAVY CONSTRUCTION EQUIPMENT OPERATOR BY AAP STATUS

SKILL LEVEL	GROUP MOS 62E	FY 87 AVG SQT/NUMBER	FY 88 AVG SQT/NUMBER
1	AAP SOLDIERS	76.50 / 272	80.20 / 265*
	NON AAP SOLDIERS	75.16 / 953	77.52 / 1159
2	AAP SOLDIERS	75.45 / 216*	80.09 / 191*
	NON AAP SOLDIERS	73.75 / 457	78.55 / 441

* Statistically Significant differences (ANOVA .95% confidence level)

(11) The percentage of MOS 62E soldiers who failed the SQT in 1987 was 2.3 percent for apprentices compared to 3.6 percent for non-apprentices, shown in table 20. Although, there was significant improvement in the SQT scores between 1987 to 1988, the percentage differences in the percent of those who failed between apprentices and non-apprentices was even greater for soldiers taking the test in FY88. For instance, 0.4 percent of the apprentices failed to meet the SQT standard compared to 2.2 percent for those non-apprentices soldiers.

TABLE 20. PERCENTAGE OF MOS 62E SOLDIERS WHO FAILED THE ARMY'S SQT

SKILL LEVEL	GROUP MOS 62E	FY 87 NUMBER/PERCENT	FY 88 NUMBER/PERCENT
1-4	AAP SOLDIERS	11 / 2.3%	2 / 0.4%
1-4	NON AAP SOLDIERS	51 / 3.6%	35 / 2.2%

* Statistically Significant differences (Chi-Square .95% confidence level)

(12) With only a few exceptions, a general pattern exists among these MOSs:

(a) Soldiers who participate in the AAP score higher on their SQT, at all skill levels, than those soldiers who did not participate in the AAP.

(b) The difference in the SQT is the greatest at the lowest skill level and then diminishes as the skill level category increases.

(c) Fewer apprentices, when compared to non-apprentices failed to meet the SQT standard for their MOS.

2. Reenlistment Rates. Table 21 compares the first-term reenlistment rates for those soldiers who joined the AAP in their first enlistment term and those from the NPS accession population. As the table reveals, soldiers who participate in the AAP reenlisted at more than double the rate of NPS soldiers. We should not read more into this table than what is presented. This is a post-hoc evaluation of performance characteristics and does not necessarily prove a cause-effect relationship. Simply put, the data suggests that during the same time-frame, those soldiers who were attracted and joined the AAP, reenlisted at significantly higher rates than soldiers from the NPS accession population.

Table 21. FIRST-TERM REENLISTMENT RATES BY AAP STATUS

TERM OF SERVICE	AAP RATES	NPS RATES
2 YEAR	44.14%	13.51%
3 YEAR	53.07%	24.20%
4 YEAR	45.12%	22.21%

3. Reason for Army Separation. Table 22 displays the nine categories currently coded to characterize the justification for Army separation. The DMDC conducted the prior attrition study based on the 54,531 soldiers who joined the AAP during their first enlistment term. To compare the reasons for Army separation the sample was extended to include all soldiers, (i.e. soldiers joining AAP during their first and subsequent enlistment terms or 63,435 soldiers) who participated in the AAP between 1979 and 1987. When comparing AAP soldiers to soldiers from the NPS accession population, a much smaller percentage of AAP soldiers were forced to separate from the Army (24.1 percent versus 37.8 percent).

The reasons that lead to separation were very similar except for "the failure to meet minimum behavioral and performance standards." Of those soldiers who participated in the AAP and separated from the Army, 11.7 percent of soldiers participating in the AAP were forced to separate because of their failure to meet minimum behavioral and performance standards. Futhermore, 23.1 percent of those soldiers from the NPS accession population were forced to separate because of their failure to meet minimum behavioral and performance standards. A higher percentage (nearly double) of soldiers form the NPS accession population versus AAP soldiers were forced to separate from the Army because of their failure to meet minimum behavioral and performance standards.

TABLE 22. REASONS THAT LEAD TO ARMY SEPARATION

SEPARATIONS REASONS	AAP Soldiers	%	NPS ACCESSION	%
EARLY RELEASES	4,253	6.7%	64,368	5.2%
MEDICAL DISQUALIFICATIONS	1,436	2.3%	70,266	5.6%
DEPENDENCY OR HARDSHIPS	497	0.8%	8,976	0.7%
DEATH	188	0.3%	3,417	0.3%
ENTRY INTO OFFICER PROGRAMS	744	1.2%	10,326	0.8%
RETIREMENT	37	0.1%	73	0.0%
FAILURE TO MEET MIN BEHAVIORAL AND PERFORMANCE STANDARDS	**7,448**	**11.7%**	**289,420**	**23.1%**
OTHER SEPARATIONS/DISCHARGE	694	1.1%	26,561	2.1%
TOTAL SEPARATIONS REASONS	15,297	24.1%	473,677	37.8%
TOTAL SOLDIERS	63,435	100.0%	1,254,072	100.0%

CHAPTER 4 - ARMY BENEFITS

1. Retention Rates. The DMDC conducted an attrition and retention study on those 54,531 soldiers who joined the AAP during their first enlistment term 1979 through 1988. They conducted similar attrition and retention studies for all Army NPS accessions, (i.e., 1,254,072 soldiers), during the same time-frame. DMDC evaluates soldier retention patterns based upon accession year cohorts. DMDC used historic data to determine the percentage of soldiers still in the Army after 1 year, 2 year, 3 years, ... and up to 9 years after they originally accessed into the Army. At the time when this retention study was conducted, 9 years of retention data existed on the FY79 accession cohort. Figure 1 displays the average retention rates for FY79-88 accession cohorts (AAP participants versus NPS accessions). The data in the figure is a composite of 9 separate accession cohorts segregated by AAP participation status. To interpret the figure, the length of service is the key element. As the length of service advances from 0 to 1 years, 9 accession cohorts were used to compute the percentage of soldiers still in the Army (98% AAP population versus 84% NPS). As the length of service progresses from 1 to 2 years, 8 accession cohorts were used to compute the percentage of soldiers still in the Army (94%

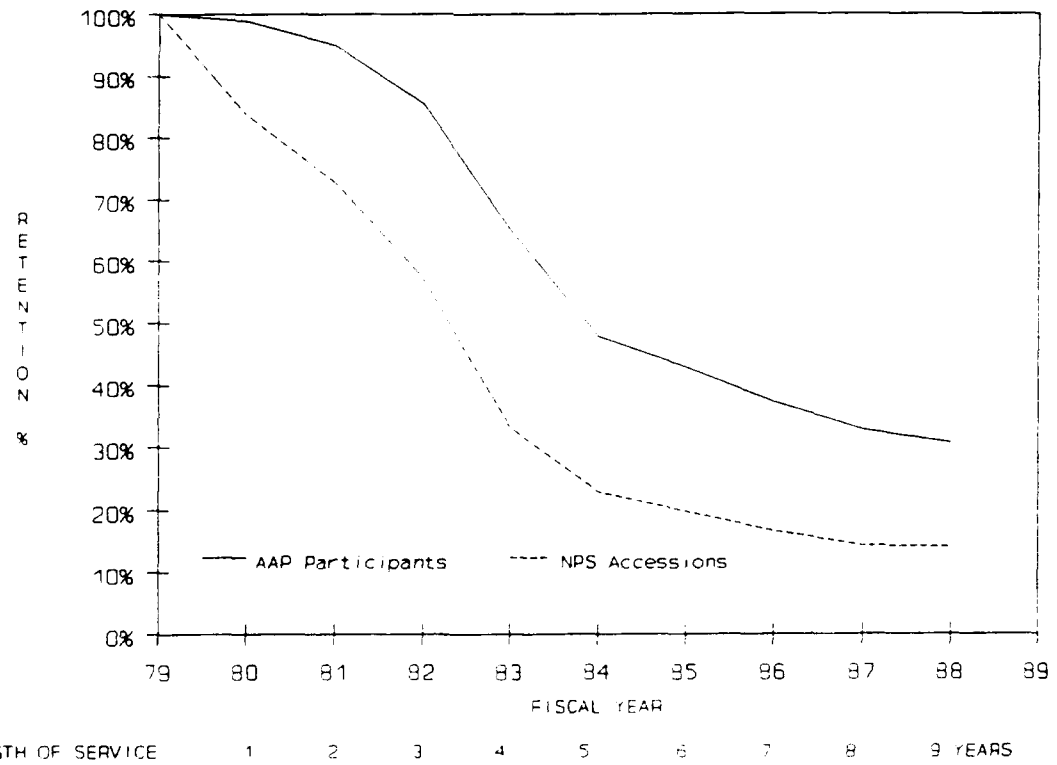


FIGURE 1. CUMULATIVE RETENTION RATES FOR FY79-88 ACCESSION COHORTS (AAP PARTICIPANTS VERSUS NPS ACCESSIONS)

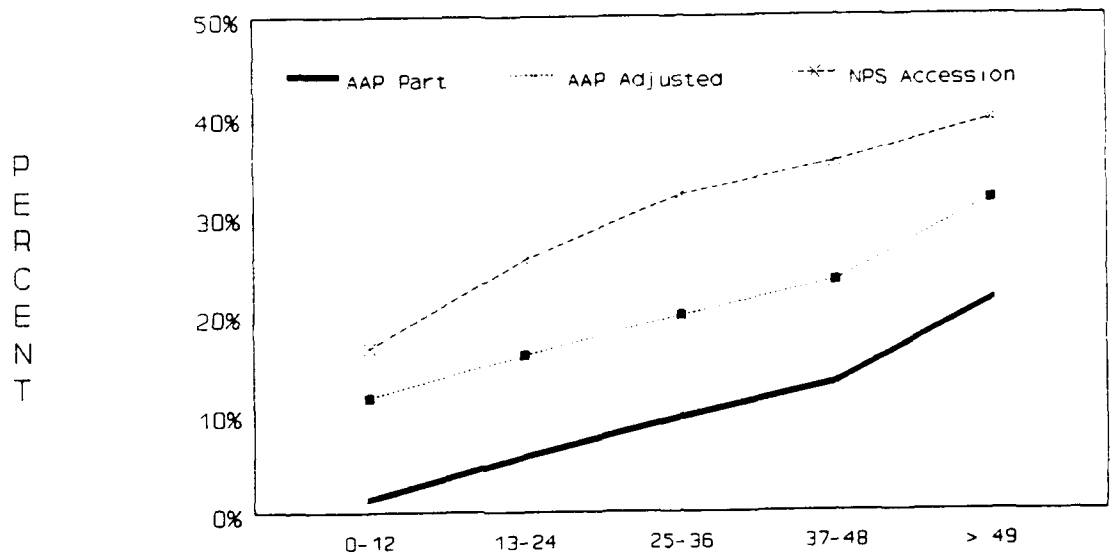
AP population versus 73% NPS). Finally, for those soldiers with 9 years of service, FY79 accession cohort, was used to determine the percentage of soldiers remaining in the Army (30% AAP population versus 14% NPS).

2. Average Active Duty Man-Months. Using the retention rates for soldiers from each accession cohort, it is possible to compute the average number of active duty man-months served in the Army. Table 23 shows that soldiers who participate in the AAP have served a significantly greater number of active duty man-months than other NPS accessions. The average number of man-months served for the nine accession cohorts was 54 months versus 36 months for soldiers from the NPS accession population.

TABLE 23. AVERAGE MONTHS OF ACTIVITY DUTY PER ACCESSION COHORT

	ACCESSIONS IN FISCAL YEAR									
COHORTS	79	80	81	82	83	84	85	86	87	79-87
AAP PARTICIPANT	72.0	69.7	66.3	60.1	53.3	49.0	43.1	34.0	23.3	54.4
NPS ACCESSION	47.5	43.5	43.5	42.4	39.2	37.3	35.6	29.5	21.7	36.0

3. Attrition Rates. Attrition is the gradual reduction in number of soldiers prior to completion of their Army commitment. Soldiers can decide not to complete their initial enlistment term because of medical problems, hardships, etc., or the Army may force soldiers to separate based on the lack of performance, disciplinary problems, etc. Figure 2 displays the cumulative attrition rates for soldiers who joined the AAP during their first enlistment term, an AAP adjusted attrition rate, and the attrition rate for the NPS accession population. The attrition rates for AAP participants were adjusted to reflect the average amount of attrition between the time when a soldier enters the Army and elects to participate in the AAP. The figure shows that the difference between the AAP adjusted attrition and the NPS accession attrition varies from between 4.99% at 0-12 months to a maximum of 11.94% at 25-36 months. Bottom-line: Soldiers who participate in the AAP attrite out of the Army at lower rates than other NPS accessions. This holds true even when adjusted for attrition prior to joining the AAP.



	0-12	13-24	25-36	37-48	> 49
AAP Part	1.39%	5.68%	9.63%	13.07%	21.28%
AAP Adjusted	11.59%	15.88%	19.83%	23.27%	31.48%
NPS Accession	16.58%	25.49%	32.01%	35.21%	39.49%

FIGURE 2. CUMULATIVE ATTRITION RATES FOR FY79-88 ACCESSION COHORTS (AAP PARTICIPANTS VERSUS NPS ACCESSIONS)

CHAPTER 5 - SOLDIERS RESPONSIVENESS TO THE AAP

1. Participation Rates. Table 24 displays the participation characteristics for a sample of soldiers who elected to become apprentices. The table identifies the ten MOSs that have the largest number of soldiers actively participating in the AAP. The soldiers in these ten MOSs represent nearly 40 percent of all of the program participants since the program began in 1976. The AAP participation rate is a function of the soldiers actively participating compared to those eligible to participate in the AAP. The percentage of apprentices of those eligible varies between 36 percent for metal workers to slightly less than 10 percent for multi-channel communication system operators. On average, for this sample of MOSs, 15.9 percent of those eligible participate in the AAP. One of the objectives for the program, as per AR 621-5, dated 25 July 86, was an annual enrollment of 15 percent. The sample data suggest that the AAP is accomplishing the participation goal of 15 percent of those eligible.

2. Completion Rates. Table 24 shows the completion rates for soldiers, in a sample of MOSs, who have participated in the AAP. In these ten MOSs, there has been a total of more than 29,000 apprentices participating in the program. The percentage of apprentices that completed the AAP varies between 3.2 percent for food service specialist to no program completion for some MOSs. As of December 1989, none of the apprentices in MOS 51B - (carpentry and masonry specialist) has completed the AAP. Of the 29,134 apprentices who participated in the program, only 414 AAP completions were recorded. This represents a 1.42% completion rate. Therefore, completion rates for the AAP are low. One of the reasons for so few completions is that most apprenticeable MOSs require soldiers to log 8000 hours of work experience to complete the AAP. By regulation, the maximum number of hours a soldier can log towards completion of the AAP is 6 hours per day. Through basic calculations, the limit that a soldier can log in a single year would be 1,560 hours by working at peak efficiency. When deducting normal leave and holidays, a soldier can log a total of 1,374 hours per year under ideal conditions. It is unrealistic to believe that a typical soldier can log a total of 1,374 hours of work experience a year because of other demands for his/her time (i.e. related instruction, duty, details, physical training, etc.). Even if a soldier could log 1,374, it would still take nearly 6 years to complete the AAP and more than one enlistment to complete the program.

TABLE 24. SAMPLE OF PARTICIPATION AND COMPLETION RATES

MOS	AAP ACTIVE	AAP INACTIVE	AAP TOTAL	CURRENT COMPLETIONS	AAP ELIGIBLE	% PARTICIPATE	% COMPLETIONS OF PARTICIPANT
94B	3,123	4,926	8,049	254	17,944	17.4%	3.2%
63B	2,580	4,526	7,106	42	18,752	13.8%	0.6%
31M	766	771	1,537	15	8,189	9.4%	1.0%
62B	761	1,548	2,309	43	4,013	19.0%	1.9%
62E	667	1,177	1,844	5	2,653	25.1%	0.3%
67N	662	1,110	1,772	20	2,477	26.7%	1.1%
63H	596	1,391	1,987	19	5,316	11.2%	1.0%
51B	560	1,094	1,654	0	2,573	21.7%	0.0%
36C	529	842	1,371	2	4,233	12.5%	0.1%
44B	511	994	1,505	14	1,410	36.2%	0.9%
TOTAL	10,755	18,379	29,134	414	67,560	15.9%	1.4%

3. Comparisons to Other Army Education Programs. Table 25 displays participation data provided by the Total Army Personnel Command (TAPC) Army Continuing Education Service (ACES) on other Army education programs. The data shown in table 25, suggests that soldier participation in other education programs may be greater. AAP participation/completion is much different than a participation/completion of other ACES programs because of the amount of time and effort involved. The amount of time involved to complete the AAP is comparable to the time needed to complete a university degree. Therefore, it may be misleading to compare AAP completions to completions in other ACES programs alone. The amount of time and effort involved in completing these programs is not equal. Another factor that affects is the underlying population of soldiers the programs are targeted towards.

TABLE 25. ELIGIBILITY AND COMPETITION RATES FOR OTHER ARMY EDUCATION PROGRAMS

PROGRAM NAME	# ENROLLED	# ELIGIBLE	% ENROLL OF ELIG
BSEP I	2,357	3,870	61.0%
BSEP II	8,599	72,162	11.9%
CSEP I	568	2,817	20.2%
CSEP II	4,314	11,790	36.6%
HCP	315	4,800	6.5%
COLLEGE - 2 YEAR PROGRAM	89,000	348,000	25.6%
COLLEGE - 4 YEAR PROGRAM	13,329	42,289	31.5%
GRADUATE PROGRAMS	9,800	53,523	18.3%

CHAPTER 6 - CONCLUSIONS

1. Demographic Characteristics of Apprentices. Army apprentices are predominantly male even though nearly all MOSs in the AAP are available to females. The percentage of female apprentices in the AAP is slightly over half that of the NPS accession population (6.8% versus 13.4%). AAP participants are slightly older when they joined the Army (average age is 20 for the AAP group compared to 19.8 years old for the non-AAP group). The AAP group had relatively the same percentage of mental category of I-IIIAs, fewer IIIBs, and a higher percentage of mental category IVs when compared to the non-AAP group. AAP participants were slightly less educated than the NPS accession population. Army apprentices enlisted for longer terms of service, received fewer enlistment cash bonuses, and signed-up for more educational incentives than soldiers from the NPS accession population.

2. Performance Attributes of Apprentices. The SQT is the US Army's principal diagnostic instrument for evaluation of individual training, job performance, and readiness. Although apprentices were previously determined to have slightly lower mental aptitudes and education attainment, apprentices performed higher on the SQT at nearly all skill levels when compared to those soldiers who did not participate in the AAP. Apprentices at skill levels 1 scored significantly higher on the SQT than non-apprentices in the same MOSs. The differences between groups diminishes as skill level increases. Furthermore, fewer apprentices failed to meet the minimum standard on the SQT when compared to non-apprentices.

3. Benefits Gained by the Army. DMDC conducted attrition and retention studies of apprentices by comparing them to soldiers from the NPS accession population. These studies determined that fewer apprentices were forced to separate from the Army (25.1% AAP versus 37.8% NPS). The largest difference in reasons why soldiers were forced to separate was in their "failure to meet minimum behavioral and performance standards" (11.7% AAP compared to 23.1% NPS). Apprentices leave the Army at lower rates than soldiers from the NPS accession population. Apprentices reenlist at higher rates and stay on active duty longer than soldiers from the NPS accession population. Therefore, the Army benefits from considerably more active duty man months of service from apprentices.

4. Responsiveness to the AAP.

a. The percentage of those soldiers who participated in the AAP varies between 36 percent for metal workers to slightly less than 10 percent for multi-channel communication system operators. On the average, for a sample of 10 MOSs, 15.9 percent of those eligible participate in the AAP. One of the objectives for the program, as per, AR 621-5, dated 25 July 86, was an annual enrollment of 15 percent. The sample data suggests that the AAP is accomplishing the participation goal of 15 percent of those eligible.

b. The percentage of apprentices that completed the AAP varies between 3.2 percent for food service specialist to no program completion for some MOSs. As of December 1989, none of the apprentices in MOS 51B (carpentry and masonry specialist) have completed the AAP. Of the 29,134 apprentices, who participated in the program, 414 AAP completions were recorded from the top ten MOSs. This represents a 1.42% completion rate. Although, completion rates for the AAP are low, over half of those soldiers completing the program are still in the Army. The phase III study report looks at the deficiencies associated with the AAP.

APPENDIX C - DATA REQUEST

ATRC-B 11 November 88

MEMORANDUM FOR: Commander, USA TRAC, Requirements and Programs Directorate, ATTN: ATRC-RPD, Fort Monroe, VA 23651-5143

SUBJECT: Data Support for Army Apprenticeship Program (AAP) Evaluation Study.

1. At the request of the Deputy Chief of Staff Personnel, Administration, and Logistics, TRADOC Analysis Command - Ft. Benjamin Harrison (TRAC-FBHN) is conducting an evaluation of the Army's Apprenticeship Program (AAP). The overall objective of the study is to determine the benefits of offering the AAP. As outlined in the study plan at enclosure 1, the first of the three phases of the AAP study will consist of an evaluation of historic data on soldiers participating in the AAP. Demographic and performance data is needed to compare soldiers who are or have participated in the AAP to soldiers in MOS's eligible to participate in the AAP and to all soldiers in the Army.

2. Request that you coordinate with the Defense Manpower Data Center (DMDC) - Monterey CA, for data to support phase I of the Army Apprenticeship Program (AAP) evaluation study as described in enclosure 2.

3. Prior coordination with Mr. Les Willis, DMDC to confirm the availability of the data and milestone planning has been made.

4. We require the complete data package NLT 13 JAN 1989. Transmit data to the following address: Director, US Army TRAC-FBHN, ATTN: ATRC-B, Bld. 401B, Ft. Ben Harrison, IN 46216-5000.

5. Point of contact for this effort is Martin R. Walker, TRAC-FBHN, AUTOVON 699-6880.

GERALD A. KLOPP, Ph.D.
Director, TRADOC Analysis
Command - Ft. Benjamin Harrison

2 Encls

CF:
Defense Manpower Data Center (DMDC) - Monterey CA,

MANPOWER DATA REQUEST

Data is needed to support the following two study questions:

(1). What are the demographic characteristics of soldiers participating in AAP? How do they compare to other soldiers in apprenticeable MOS's and to all other soldiers in the Army? The following variables will be evaluated:

- Sex
- Race/Ethnicity
- ASVAB
- Education status
- Geographical
  -- Region accessed
  -- Area type (urban/rural)

Army Variables

- Enlistment term
- Enlistment bonuses
- Education entitlement (Army College Fund)

(2). What are the performance attributes of the soldiers once they start participating in the AAP? How do they compare to other soldiers in apprenticeable MOS's and to all other soldiers in the Army? The following variables will be evaluated:

- Retention
  -- Attrition rates (1st-term AAP soldiers versus NPS accession population)
  -- Reenlistment rates (see above)
  -- Average months served

- Grade Progression
- Primary MOS changes
- SQT Scores
- Supervisor Ratings
- AWOL, Criminal Actions

APPENDIX D - DATA VALIDATION STATEMENT

ATRC-B 31 July 1990

MEMORANDUM FOR RECORD:

SUBJECT: Data Validation for Army Apprenticeship Program (AAP) Evaluation Study.

1. At the request of the Deputy Chief of Staff Personnel, Administration, and Logistics, TRADOC Analysis Command - Ft. Benjamin Harrison (TRAC-FBHN) is conducting an evaluation of the Army's Apprenticeship Program (AAP). The overall objective of the study is to determine the benefits of offering the AAP. As outlined in the study plan at enclosure 1, the first of the three phases of the AAP study will consist of an evaluation of historic data on soldiers participating in the AAP. Demographic and performance data is needed to compare soldiers who are or have participated in the AAP to soldiers in MOS's eligible to participate in the AAP and to all soldiers in the Army.

2. Defense Manpower Data Center (DMDC) - Monterey CA, provided data to support phase I of the AAP evaluation study as described in the initial data request.

3. US Army Training Support Center - Ft Eustis, provided Skill Qualification Test (SQT) scores to support phase I of the AAP evaluation study as described in the initial data request.

4. The data was provided directly to TRAC-FBHN on or about 14 March 1989.

5. As per a phone conversation with Mr. Rod Alvarado on 30 July 90, not all government are required to supply a letter of data validation. The study director must verify the accuracy of the data and validate that the data was adequate for the purposes of the study.

6. Martin Walker inspected both the data provided by DMDC and ATSC. He had to send the partial data package back to DMDC because of data errors. DMDC personnel reprogrammed and sent the completed data package on 2 MAR 89. The data was reviewed and inspected for accuracy and was considered appropriate for the AAP Evaluation Study.

GERALD A. KLOPP, Ph.D.
Director, TRADOC Analysis
Command - Ft. Benjamin Harrison

APPENDIX E - STATISTICS

QT SCORES FOR MOS 94B - 1987
EANS SQT BY SKILL LEVEL

ummaries of SQT87
y levels of SKL87 SKILL LEVEL IN 1987
AAP

ariable	Value	Label	Mean	Std Dev	Cases
or Entire Population			72.0440	10.0682	13546
KL87	1		69.6916	10.0460	7415
AAP	1.00	AAP PARTICIPANT	72.2806	9.3343	987
AAP	2.00	NON AAP PARTICIPANT	69.2940	10.0929	6428
KL87	2		77.5062	9.3041	2254
AAP	1.00	AAP PARTICIPANT	78.2521	8.7484	607
AAP	2.00	NON AAP PARTICIPANT	77.2313	9.4885	1647
KL87	3		72.0035	9.0357	2270
AAP	1.00	AAP PARTICIPANT	73.1095	8.9925	676
AAP	2.00	NON AAP PARTICIPANT	71.5345	9.0159	1594
KL87	4		75.2943	8.6169	1607
AAP	1.00	AAP PARTICIPANT	76.1548	9.7299	323
AAP	2.00	NON AAP PARTICIPANT	75.0779	8.3037	1284

Total Cases = 13546

SQT SCORES FOR MOS 94B - 1988
MEANS SQT BY SKILL LEVEL

Summaries of SQT88 SQT SCORE - 1988
By levels of SKL88 SKILL LEVEL IN 1988
AAP

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			73.6234	9.7145	14755
SKL88	1		70.7910	9.6218	8625
AAP	1.00	AAP PARTICIPANT	74.0755	8.4255	888
AAP	2.00	NON AAP PARTICIPANT	70.4140	9.6792	7737
SKL88	2		74.1858	7.1392	2330
AAP	1.00	AAP PARTICIPANT	75.1113	6.3659	602
AAP	2.00	NON AAP PARTICIPANT	73.8634	7.3640	1728
SKL88	3		78.2051	8.4828	2175
AAP	1.00	AAP PARTICIPANT	78.3885	9.0250	641
AAP	2.00	NON AAP PARTICIPANT	78.1284	8.2475	1534
SKL88	4		81.7188	7.7174	1625
AAP	1.00	AAP PARTICIPANT	83.0162	6.9219	371
AAP	2.00	NON AAP PARTICIPANT	81.3349	7.8993	1254

Total Cases = 14755

SQT SCORES FOR MOS 94B - 1988
MEANS SQT BY SKILL LEVEL

SKILL LEVEL = 1

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	7632.0722	7632.0722	76.3921	.0000
Within Groups	7413	740607.5510	99.9066		
Total	7414	748239.6232			

SQT SCORES FOR MOS 94B - 1987
SKILL LEVEL = 2

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	462.1147	462.1147	5.3486	.0208
Within Groups	2252	194571.2983	86.3993		
Total	2253	195033.4130			

SQT SCORES FOR MOS 94B - 1987
SKILL LEVEL = 3

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	1177.4701	1177.4701	14.5077	.0001
Within Groups	2268	184074.5017	81.1616		
Total	2269	185251.9718			

SQT SCORES FOR MOS 94B - 1987
SKILL LEVEL = 4

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	299.3066	299.3066	4.0386	.0446
Within Groups	1605	118948.4719	74.1112		
Total	1606	119247.7785			

SQT SCORES FOR MOS 94B - 1988
SKILL LEVEL = 1

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Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	10679.1429	10679.1429	116.9015	.0000
Within Groups	8623	787724.9517	91.3516		
Total	8624	798404.0946			

SQT SCORES FOR MOS 94B - 1988
SKILL LEVEL = 2

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	695.2209	695.2209	13.7148	.0002
Within Groups	2328	118009.3117	50.6913		
Total	2329	118704.5326			

SQT SCORES FOR MOS 94B - 1988
SKILL LEVEL = 3

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	30.5690	30.5690	.4247	.5147
Within Groups	2173	156405.9754	71.9770		
Total	2174	156436.5444			

SQT SCORES FOR MOS 94B - 1988
SKILL LEVEL = 4

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	809.2444	809.2444	13.6937	.0002
Within Groups	1623	95913.2331	59.0963		
Total	1624	96722.4775			

PASS/FAIL SQT FOR MOS 94B - 1987

Crosstabulation: PASS87 By AAP

PASS87	Count / Row Pct / Col Pct / Tot Pct	1.00	2.00	Row Total
	1.00	2464	9911	12375
		19.9	80.1	91.4
		95.0	90.5	
		18.2	73.2	
	2.00	129	1042	1171
		11.0	89.0	8.6
		5.0	9.5	
		1.0	7.7	
	Column Total	2593	10953	13546
		19.1	80.9	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
54.11058	1	.0000	224.155	None
54.68377	1	.0000	(Before Yates Correction)	

Number of Missing Observations = 0

PASS/FAIL SQT FOR MOS 94B - 1988

Crosstabulation: PASS87 By AAP

PASS87	Count / Row Pct / Col Pct / Tot Pct	1.00	2.00	Row Total
	1.00	1925	7035	8960
		21.5	78.5	92.3
		96.0	91.3	
		19.8	72.4	
	2.00	81	670	751
		10.8	89.2	7.7
		4.0	8.7	
		.8	6.9	
	Column Total	2006	7705	9711
		20.7	79.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
47.74158	1	.0000	155.134	None
48.39214	1	.0000	(Before Yates Correction)	

SQT SCORES FOR MOS 63B - 1987 8/15/90
MEANS SQT BY SKILL LEVEL

Summaries of SQT87
By levels of SKL87 SKILL LEVEL IN 1987
AAP

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			71.3938	11.8873	14358
SKL87	1		66.7993	9.5344	8464
AAP	1.00	AAP PARTICIPANT	69.3362	9.4763	824
AAP	2.00	NON AAP PARTICIPANT	66.5257	9.5009	7640
SKL87	2		69.4330	9.8811	2554
AAP	1.00	AAP PARTICIPANT	69.3387	10.3114	499
AAP	2.00	NON AAP PARTICIPANT	69.4560	9.7762	2055
SKL87	3		84.4355	8.7002	2053
AAP	1.00	AAP PARTICIPANT	84.9010	7.5283	404
AAP	2.00	NON AAP PARTICIPANT	84.3214	8.9624	1649
SKL87	4		84.6970	8.3379	1287
AAP	1.00	AAP PARTICIPANT	84.9034	11.3519	145
AAP	2.00	NON AAP PARTICIPANT	84.6708	7.8795	1142

Total Cases = 14358

SQT SCORES FOR MOS 63B - 1988 8/15/90
MEANS SQT BY SKILL LEVEL

Summaries of SQT88 SQT SCORE - 1988
By levels of SKL88 SKILL LEVEL IN 1988
AAP

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			69.0191	11.0748	14190
SKL88	1		64.9557	10.4408	7871
AAP	1.00	AAP PARTICIPANT	69.0943	9.1869	562
AAP	2.00	NON AAP PARTICIPANT	64.6374	10.4640	7309
SKL88	2		69.4724	8.1786	2644
AAP	1.00	AAP PARTICIPANT	69.1693	9.7093	508
AAP	2.00	NON AAP PARTICIPANT	69.5445	7.7711	2136
SKL88	3		77.0457	9.2000	2383
AAP	1.00	AAP PARTICIPANT	76.4896	9.6958	480
AAP	2.00	NON AAP PARTICIPANT	77.1860	9.0679	1903
SKL88	4		78.0418	9.4283	1292
AAP	1.00	AAP PARTICIPANT	78.9748	9.8687	159
AAP	2.00	NON AAP PARTICIPANT	77.9109	9.3619	1133

Total Cases = 14190

SQT SCORES FOR MOS 63B - 1987 8/15/90
SKILL LEVEL = 1

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	5875.1014	5875.1014	65.1183	.0000
Within Groups	8462	763458.8540	90.2220		
Total	8463	769333.9555			

SQT SCORES FOR MOS 63B - 1987 8/15/90
SKILL LEVEL = 2

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	5.5229	5.5229	.0565	.8121
Within Groups	2552	249257.5280	97.6714		
Total	2553	249263.0509			

SQT SCORES FOR MOS 63B - 1987 8/15/90
SKILL LEVEL = 3

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	109.0046	109.0046	1.4404	.2302
Within Groups	2051	155215.6939	75.6781		
Total	2052	155324.6985			

SQT SCORES FOR MOS 63B - 1987 8/15/90
SKILL LEVEL = 4

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	6.9668	6.9668	.1001	.7517
Within Groups	1285	89396.8514	69.5695		
Total	1286	89403.8182			

SQT SCORES FOR MOS 63B - 1988 8/15/90
SKILL LEVEL = 1

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	10366.3253	10366.3253	96.2460	.0000
Within Groups	7869	847543.2000	107.7066		
Total	7870	857909.5253			

SQT SCORES FOR MOS 63B - 1988 8/15/90
SKILL LEVEL = 2

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	57.7687	57.7687	.8636	.3528
Within Groups	2642	176729.2158	66.8922		
Total	2643	176786.9845			

SQT SCORES FOR MOS 63B - 1988 8/15/90
SKILL LEVEL = 3

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	185.9182	185.9182	2.1977	.1384
Within Groups	2381	201426.0961	84.5973		
Total	2382	201612.0143			

SQT SCORES FOR MOS 63B - 1988 8/15/90
SKILL LEVEL = 4

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	157.8472	157.8472	1.7768	.1828
Within Groups	1290	114601.8958	88.8387		
Total	1291	114759.7430			

PASS/FAIL SQT FOR MOS 63B - 1987 8/15/90

Crosstabulation: PASS87 By AAP

PASS87	Count / Row Pct / Col Pct / Tot Pct	AAP PART ICIPANT 1.00	NON AAP PARTICIP 2.00	Row Total
1.00		1723	10758	12481
		13.8	86.2	86.9
		92.0	86.2	
		12.0	74.9	
2.00		149	1728	1877
		7.9	92.1	13.1
		8.0	13.8	
		1.0	12.0	
Column Total		1872	12486	14358
		13.0	87.0	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
49.01509	1	.0000	244.724	None
49.53117	1	.0000	(Before Yates Correction)	

Number of Missing Observations = 0

PASS/FAIL SQT FOR MOS 63B - 1988 8/15/90

Crosstabulation: PASS87 By AAP

PASS87	Count / Row Pct / Col Pct / Tot Pct	AAP PART ICIPANT 1.00	NON AAP PARTICIP 2.00	Row Total
1.00		1236	7463	8699
		14.2	85.8	87.4
		92.8	86.5	
		12.4	75.0	
2.00		96	1160	1256
		7.6	92.4	12.6
		7.2	13.5	
		1.0	11.7	
Column Total		1332	8623	9955
		13.4	86.6	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
40.25202	1	.0000	168.055	None
40.81651	1	.0000	(Before Yates Correction)	

)T SCORES FOR MOS 31M - 1987 8/15/90
:ANS SQT BY SKILL LEVEL

ummaries of SQT87
' levels of SKL87 SKILL LEVEL IN 1987
AAP

ıriable	Value	Label	Mean	Std Dev	Cases
)r Entire Population			80.4041	10.5175	6372
(L87	1		77.7451	11.1936	3645
AAP	1.00	AAP PARTICIPANT	80.9513	9.1643	226
AAP	2.00	NON AAP PARTICIPANT	77.5332	11.2839	3419
(L87	2		84.4488	8.7578	1867
AAP	1.00	AAP PARTICIPANT	84.7085	8.6040	247
AAP	2.00	NON AAP PARTICIPANT	84.4093	8.7830	1620
(L87	3		82.8930	7.1082	860
AAP	1.00	AAP PARTICIPANT	83.2296	7.0963	135
AAP	2.00	NON AAP PARTICIPANT	82.8303	7.1135	725

Total Cases = 6372

SQT SCORES FOR MOS 31M - 1988 8/15/90
MEANS SQT BY SKILL LEVEL

Summaries of SQT88 SQT SCORE - 1988
By levels of SKL88 SKILL LEVEL IN 1988
AAP

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			79.1468	10.9764	7207
SKL88	1		76.2550	10.8976	4607
AAP	1.00	AAP PARTICIPANT	79.6059	9.2454	203
AAP	2.00	NON AAP PARTICIPANT	76.1006	10.9439	4404
SKL88	2		87.0330	7.8297	1578
AAP	1.00	AAP PARTICIPANT	87.2886	6.2766	201
AAP	2.00	NON AAP PARTICIPANT	86.9956	8.0325	1377
SKL88	3		80.0059	9.2367	1022
AAP	1.00	AAP PARTICIPANT	80.1696	8.6861	171
AAP	2.00	NON AAP PARTICIPANT	79.9730	9.3479	851

Total Cases = 7207

SQT SCORES FOR MOS 31M - 1987 8/15/90
SKILL LEVEL = 1

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	2476.7793	2476.7793	19.8698	.0000
Within Groups	3643	454101.4468	124.6504		
Total	3644	456578.2261			

SQT SCORES FOR MOS 31M - 1987 8/15/90
SKILL LEVEL = 2

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	19.1918	19.1918	.2501	.6171
Within Groups	1865	143102.6733	76.7307		
Total	1866	143121.8650			

SQT SCORES FOR MOS 31M - 1987 8/15/90
SKILL LEVEL = 3

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	18.1442	18.1442	.3588	.5493
Within Groups	858	43384.0139	50.5641		
Total	859	43402.1581			

SQT SCORES FOR MOS 31M - 1988 8/15/90
SKILL LEVEL = 1

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	2384.4088	2384.4088	20.1616	.0000
Within Groups	4605	544608.9114	118.2647		
Total	4606	546993.3202			

SQT SCORES FOR MOS 31M - 1988 8/15/90
SKILL LEVEL = 2

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	15.0489	15.0489	.2454	.6204
Within Groups	1576	96661.2375	61.3333		
Total	1577	96676.2864			

SQT SCORES FOR MOS 31M - 1988 8/15/90
SKILL LEVEL = 3

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	5.5045	5.5045	.0645	.7996
Within Groups	1020	87102.4602	85.3946		
Total	1021	87107.9648			

PASS/FAIL SQT FOR MOS 31M - 1987

Crosstabulation: PASS87 By AAP

PASS87 / AAP->	AAP PARTICIPANT 1.00	NON AAP PARTICIP 2.00	Row Total
1.00	601	5560	6161
Row Pct	9.8	90.2	96.7
Col Pct	98.8	96.5	
Tot Pct	9.4	87.3	
2.00	7	204	211
Row Pct	3.3	96.7	3.3
Col Pct	1.2	3.5	
Tot Pct	.1	3.2	
Column Total	608	5764	6372
	9.5	90.5	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
9.06327	1	.0026	20.133	None
9.79489	1	.0017	(Before Yates Correction)	

Number of Missing Observations = 0

PASS/FAIL SQT FOR MOS 31M - 1988

Crosstabulation: PASS87 By AAP

PASS87 / AAP->	AAP PARTICIPANT 1.00	NON AAP PARTICIP 2.00	Row Total
1.00	447	4005	4452
Row Pct	10.0	90.0	97.3
Col Pct	99.3	97.1	
Tot Pct	9.8	87.6	
2.00	3	119	122
Row Pct	2.5	97.5	2.7
Col Pct	.7	2.9	
Tot Pct	.1	2.6	
Column Total	450	4124	4574
	9.8	90.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
6.86354	1	.0088	12.003	None
7.69450	1	.0055	(Before Yates Correction)	

SQT SCORES FOR MOS 62B - 1987 8/15/90
MEANS SQT BY SKILL LEVEL

Summaries of SQT87
By levels of SKL87 SKILL LEVEL IN 1987
AAP

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			69.5754	10.2088	3264
SKL87	1		69.5678	10.5748	1925
AAP	1.00	AAP PARTICIPANT	71.8994	9.8542	338
AAP	2.00	NON AAP PARTICIPANT	69.0712	10.6593	1587
SKL87	2		69.9015	9.4129	650
AAP	1.00	AAP PARTICIPANT	70.3626	7.7268	171
AAP	2.00	NON AAP PARTICIPANT	69.7370	9.9481	479
SKL87	3		70.9179	9.0581	390
AAP	1.00	AAP PARTICIPANT	71.0171	8.4015	117
AAP	2.00	NON AAP PARTICIPANT	70.8755	9.3399	273
SKL87	4		67.1639	10.5199	299
AAP	1.00	AAP PARTICIPANT	66.9556	15.1881	45
AAP	2.00	NON AAP PARTICIPANT	67.2008	9.4986	254

Total Cases = 3264

SQT SCORES FOR MOS 62B - 1988 8/15/90
MEANS SQT BY SKILL LEVEL

Summaries of SQT88 SQT SCORE - 1988
By levels of SKL88 SKILL LEVEL IN 1988
AAP

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			77.2504	10.8708	3438
SKL88	1		76.8263	11.6141	2084
AAP	1.00	AAP PARTICIPANT	79.3658	10.9072	298
AAP	2.00	NON AAP PARTICIPANT	76.4026	11.6771	1786
SKL88	2		80.0396	9.3993	681
AAP	1.00	AAP PARTICIPANT	80.3277	8.5636	177
AAP	2.00	NON AAP PARTICIPANT	79.9385	9.6817	504
SKL88	3		78.1759	8.1370	432
AAP	1.00	AAP PARTICIPANT	78.4436	7.4023	133
AAP	2.00	NON AAP PARTICIPANT	78.0569	8.4524	299
SKL88	4		71.3776	9.6235	241
AAP	1.00	AAP PARTICIPANT	74.5581	8.0602	43
AAP	2.00	NON AAP PARTICIPANT	70.6869	9.8126	198

Total Cases = 3438

SQT SCORES FOR MOS 62B - 1987 8/15/90
SKILL LEVEL = 1

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	2228.8692	2228.8692	20.1296	.0000
Within Groups	1923	212925.5339	110.7257		
Total	1924	215154.4031			

SQT SCORES FOR MOS 62B - 1987 8/15/90
SKILL LEVEL = 2

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	49.3220	49.3220	.5563	.4560
Within Groups	648	57454.3764	88.6642		
Total	649	57503.6985			

SQT SCORES FOR MOS 62B - 1987 8/15/90
SKILL LEVEL = 3

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	1.6430	1.6430	.0200	.8877
Within Groups	388	31915.7314	82.2570		
Total	389	31917.3744			

SQT SCORES FOR MOS 62B - 1987 8/15/90
SKILL LEVEL = 4

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	2.2989	2.2989	.0207	.8857
Within Groups	297	32976.6710	111.0326		
Total	298	32978.9699			

SQT SCORES FOR MOS 62B - 1988 8/15/90
SKILL LEVEL = 1

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	2242.4400	2242.4400	16.7503	.0000
Within Groups	2082	278726.6790	133.8745		
Total	2083	280969.1190			

SQT SCORES FOR MOS 62B - 1988 8/15/90
SKILL LEVEL = 2

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	19.8419	19.8419	.2243	.6359
Within Groups	679	60056.0876	88.4478		
Total	680	60075.9295			

SQT SCORES FOR MOS 62B - 1988 8/15/90
SKILL LEVEL = 3

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	13.7691	13.7691	.2076	.6489
Within Groups	430	28522.8605	66.3322		
Total	431	28536.6296			

SQT SCORES FOR MOS 62B - 1988 8/15/90
SKILL LEVEL = 4

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	529.4485	529.4485	5.8320	.0165
Within Groups	239	21697.1905	90.7832		
Total	240	22226.6390			

PASS/FAIL SQT FOR MOS 62B - 1987 8/15/90

Crosstabulation: PASS87 By AAP

PASS87	AAP->	AAP PARTICIPANT 1.00	NON AAP PARTICIP 2.00	Row Total
1.00	Count	596	2148	2744
	Row Pct	21.7	78.3	84.1
	Col Pct	88.8	82.8	
	Tot Pct	18.3	65.8	
2.00	Count	75	445	520
	Row Pct	14.4	85.6	15.9
	Col Pct	11.2	17.2	
	Tot Pct	2.3	13.6	
Column Total		671	2593	3264
		20.6	79.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
13.80968	1	.0002	106.900	None
14.25299	1	.0002	(Before Yates Correction)	

PASS/FAIL SQT FOR MOS 62B - 1988 8/15/90

Crosstabulation: PASS87
By AAP

PASS87	AAP->	AAP PARTICIPANT 1.00	NON AAP PARTICIP 2.00	Row Total
1.00	Count	470	1584	2054
	Row Pct	22.9	77.1	85.3
	Col Pct	89.4	84.1	
	Tot Pct	19.5	65.8	
2.00	Count	56	299	355
	Row Pct	15.8	84.2	14.7
	Col Pct	10.6	15.9	
	Tot Pct	2.3	12.4	
Column Total		526	1883	2109
		21.8	78.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
8.54756	1	.0035	77.513	None
8.95916	1	.0028	(Before Yates Correction)	

QT SCORES FOR MOS 62E - 1987 8/15/90
EANS SQT BY SKILL LEVEL

ummaries of SQT87
/ levels of SKL87 SKILL LEVEL IN 1987
AAP

ariable	Value	Label	Mean	Std Dev	Cases
or Entire Population			75.0464	9.8253	1898
KL87	1		75.4580	10.1267	1225
AAP	1.00	AAP PARTICIPANT	76.5000	11.8184	272
AAP	2.00	NON AAP PARTICIPANT	75.1605	9.5755	953
KL87	2		74.2972	9.2118	673
AAP	1.00	AAP PARTICIPANT	75.4491	8.3380	216
AAP	2.00	NON AAP PARTICIPANT	73.7527	9.5577	457

Total Cases = 1898

SQT SCORES FOR MOS 62E - 1988 8/15/90
MEANS SQT BY SKILL LEVEL

Summaries of SQT88 SQT SCORE - 1988
By levels of SKL88 SKILL LEVEL IN 1988
AAP

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			78.3225	7.9816	2056
SKL88	1		78.0154	8.5379	1424
AAP	1.00	AAP PARTICIPANT	80.1962	8.6602	265
AAP	2.00	NON AAP PARTICIPANT	77.5168	8.4346	1159
SKL88	2		79.0142	6.5109	632
AAP	1.00	AAP PARTICIPANT	80.0890	5.7972	191
AAP	2.00	NON AAP PARTICIPANT	78.5488	6.7499	441

Total Cases = 2056

SQT SCORES FOR MOS 62E - 1987 8/15/90
SKILL LEVEL = 1

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	379.6484	379.6484	3.7103	.0543
Within Groups	1223	125140.4365	102.3225		
Total	1224	125520.0849			

SQT SCORES FOR MOS 62E - 1987 8/15/90
SKILL LEVEL = 2

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT87

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	422.0657	422.0657	5.0034	.0256
Within Groups	671	56602.4989	84.3554		
Total	672	57024.5646			

SQT SCORES FOR MOS 62E - 1988 8/15/90
SKILL LEVEL = 1

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	1548.4420	1548.4420	21.5484	.0000
Within Groups	1422	102183.2181	71.8588		
Total	1423	103731.6601			

SQT SCORES FOR MOS 62E - 1988 8/15/90
SKILL LEVEL = 2

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable SQT88 SQT SCORE - 1988

By Variable AAP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	316.1831	316.1831	7.5359	.0062
Within Groups	630	26432.6887	41.9566		
Total	631	26748.8718			

PASS/FAIL SQT FOR MOS 62E - 1987 8/15/90

Crosstabulation: PASS87 By AAP

PASS87	Count / Row Pct / Col Pct / Tot Pct	AAP PARTICIPANT 1.00	NON AAP PARTICIP 2.00	Row Total
1.00		477	1359	1836
		26.0	74.0	96.7
		97.7	96.4	
		25.1	71.6	
2.00		11	51	62
		17.7	82.3	3.3
		2.3	3.6	
		.6	2.7	
Column Total		488	1410	1898
		25.7	74.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
1.72165	1	.1895	15.941	None
2.13115	1	.1443	(Before Yates Correction)	

PASS/FAIL SQT FOR MOS 62E - 1988 8/15/90

Crosstabulation: PASS87
By AAP

PASS87	Count / Row Pct / Col Pct / Tot Pct	AAP PARTICIPANT 1.00	NON AAP PARTICIP 2.00	Row Total
1.00		339	945	1284
		26.4	73.6	97.1
		98.0	96.8	
		25.6	71.5	
2.00		7	31	38
		18.4	81.6	2.9
		2.0	3.2	
		.5	2.3	
Column Total		346	976	1322
		26.2	73.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
.83863	1	.3598	9.946	None
1.21660	1	.2700	(Before Yates Correction)	

APPENDIX F - REFERENCES

REFERENCES

1. Eastman, R. F., (1981) Supervisor Ratings as a Criteria for Skill Qualification Test, Army Training Support Center, Fort Eustis, VA.

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